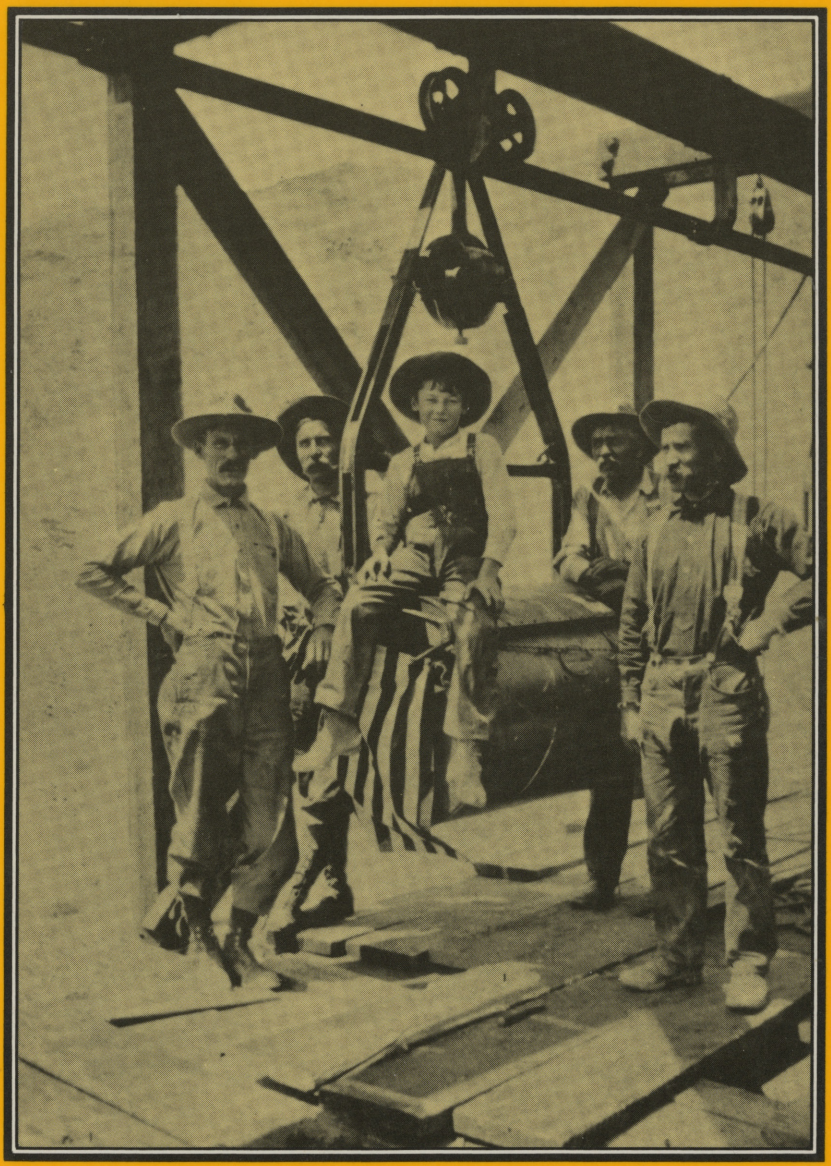
White Smith's

Fabulous Salt Tram



by Mary DeDecker

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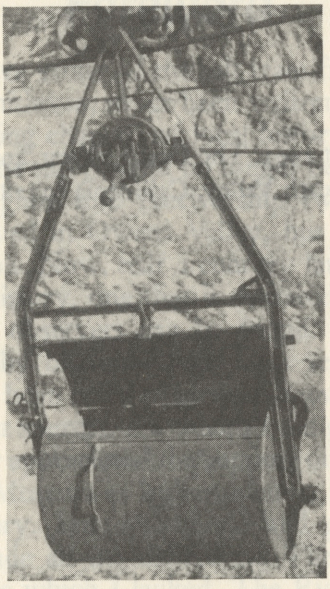
Cover Photo: Unidentified workers—and a youthful visitor—pose at the Owens Valley terminal of the Saline Valley Salt Tram, July 2, 1913.
—County of Inyo, Eastern Calif. Museum Photo

White Smith's

Fabulous Salt Tram

OVERLEAF: View of White Smith's salt tram looking east down Daisy Canyon, "the source of many difficulties" (pg. 8). Tram station No. 11 is seen in the foreground, the floor of Saline Valley in the middle distance, with the Cottonwood Mountains of the Panamint Range further back. —COUNTY OF INYO, EASTERN CALIF. MUSEUM PHOTO

White Smith's
Fabulous Salt Tram



KEEPSAKE No. 33

by Mary DeDecker

Published for the
44th Annual Death Valley '49ers Encampment
November 10-14, 1993
Death Valley, California

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Death Valley, California 92328

Produced for the Death Valley '49ers, Inc.
by the
SAGEBRUSH PRESS
Morongo Valley, California 92256

Printed in the United States of America

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Foreword

A COMPREHENSIVE STORY of the salt tram from Saline Valley to Owens Valley has, hitherto, never been written—although it is one of the most fascinating chapters of local history. Finally, I decided that this long overdue story could no longer be ignored.

The tram had gone into receivership two years before my husband and I arrived in Owens Valley, but it was still a major topic of conversation. Now, half a century later it is considered a remarkable bit of history, one that is centered just west of Death Valley. Few actual observers can be found. The tram itself has been removed, bit by bit, until little of it remains on the actual route. My story has been made possible, however, by the discovery of several significant sources, for which I am grateful.

I have especially appreciated the support of Don Becker of The Eastern California Museum in Independence. He lives in the glow of the tram's history. His enthusiasm and generous sharing of information has made all the difference. The Museum has made available any photos which I lacked. The Ridgecrest Area Office of the Bureau of Land Management shared its file on the tramway, including Paper No. 1394 of the American Society of Civil Engineers entitled *An Aerial Tramway for the Saline Valley Salt Company, Inyo County, California.* Most of the statistics came from that publication. The elevational diagram and map, used herein, originated in an article by Robert O. Greenawalt entitled "We Hiked the Bucket Brigade", published in the August, 1959 issue of *Desert* Magazine.

My own explorations in the Inyo Mountains, motivated by botanical as well as historical interest, have given me the visual perception to put it all together.

—MARY DEDECKER

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White Smith's

Fabulous Salt Tram

LITTLE MORE THAN ghostly memories are left of the most remarkable engineering feat that ever occurred in Inyo County. Its towers still may be seen, however, on the more remote parts of its route, standing like sentinels on the skyline. This was the Saline Valley to Swansea salt tram.

Saline Valley is a deep basin just east of Owens Valley between the Inyo Mountains and the northerly extension of the Panamints. The mountains surrounding it made access difficult. Swansea was a settlement north of the Keeler township, on the shores of Owens Lake.

The mining craze began with the gold rush in the mid-19th Century, then silver was recognized as a source of wealth. By the turn of the century those who failed to find those precious metals were searching the most inhospitable regions of the west for non-metallic deposits. Vast amounts might be there for the taking, but there was usually some difficulty in getting the product to market.

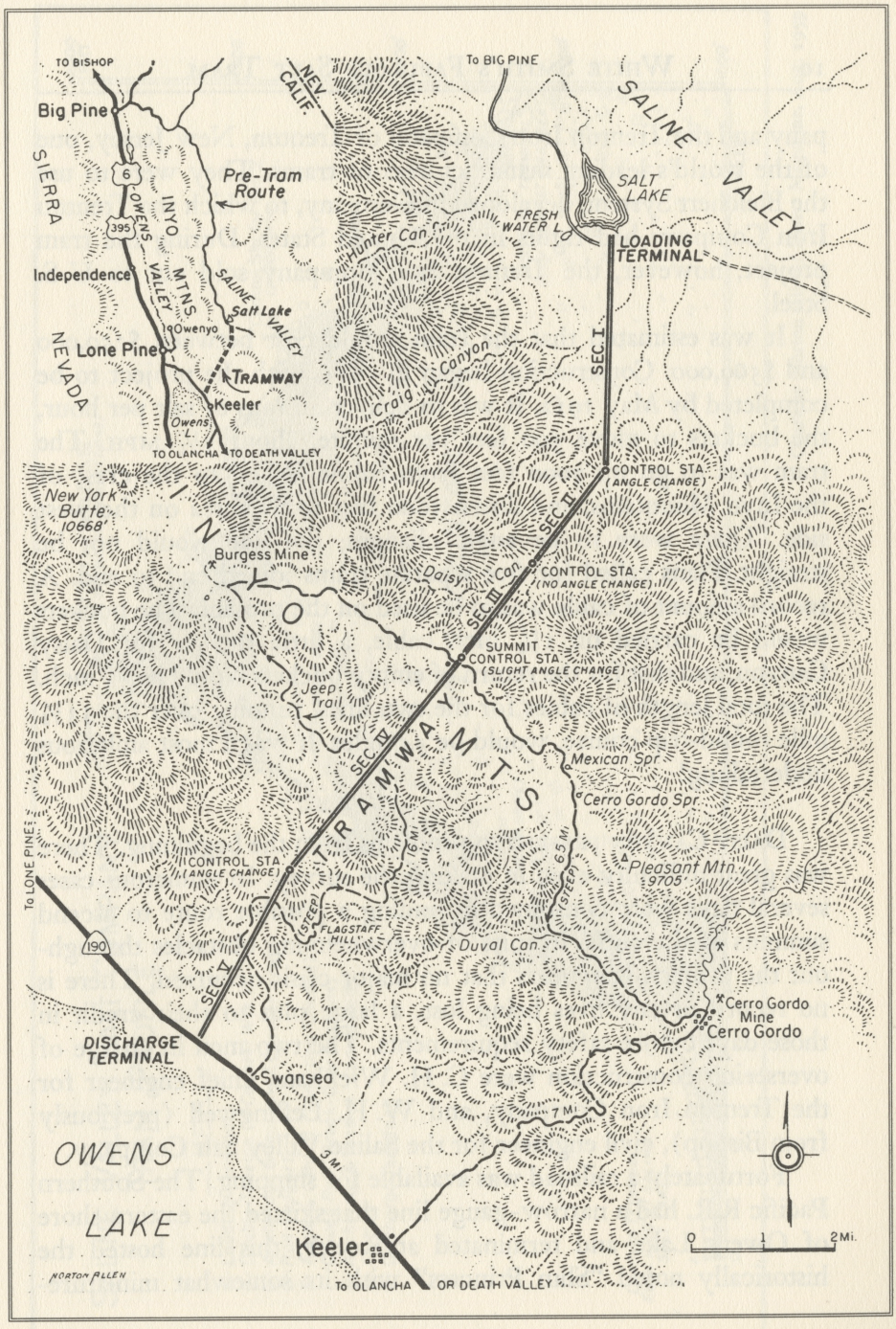
Borax became the great white hope. Any hot, dry basin was a likely prospect. Gold still created the most hysteria, but when the restless followers of those strikes moved on, some turned to borates to make their fortunes. Even remote Saline Valley was not overlooked. When a gold strike took place there in the early 1880s it attracted 2000 people at the peak of the excitement, but it was short-lived. Borax deposits were found on the floor of the valley in 1874 but were mostly ignored in the frenzy for gold. Two men, by the names of Conn and Trudo, came over from Candelaria (Nevada) however, and quietly started a borax operation. They built a reduction plant 1½ miles north of the spring in the salt marsh. Evidence of this activity can still be seen along the road

opposite Hunter Canyon. The product was trucked out by way of the north road to Big Pine for about seven years; that route is now blocked by huge boulders in a narrows of the Saline Range.

White Smith, an alert teamster in the borax operation, made note of the nearby fields of almost pure salt. He even filed some claims. It was his dream and his never-ending faith in the potential of salt harvesting that resulted in a long period of salt production. He had come to Bishop with relatives from Tennessee and found employment hauling borax and supplies to and from Saline Valley. Once he saw the salt fields his determination to develop them never wavered. He and 71 others filed claims amounting to 1480 acres. Smith organized the Saline Valley Salt Company. The locators included W. W. Watterson, a prominent figure in the history of Owens Valley. The stage was set for a large scale salt operation.

THE OBVIOUS BARRIER to overcome was transportation. An article in the *San Francisco Chronicle*, dated December 1882, tells of the salt deposits in Saline Valley, stating that the only problem was to get it out to market. Various proposals were considered. The idea of a railroad from the south was weighed because it might be used also to haul ore from copper mines in the vicinity but that was determined to be too costly. A.W. Leffingwell of Bishop suggested piping the salt in a brine over the Inyo Mountains. That was considered a good idea, but was discarded because it could not convey supplies back to Saline Valley. The idea of transporting the salt directly over the Inyo Mountains did have appeal, however. When a tramway was proposed its advantages were obvious, especially its ability to carry loads both ways. In 1911 a decision was made to proceed with that proposal, and a route was selected that same year. It was to ascend Daisy Canyon, a steep but most direct route to the crest of the Inyo Mountains, at an elevation of 8,720 feet, and down the west side to Swansea on the shore of Owens Lake. Daisy Canyon, however, was to be the source of many difficulties.

A contract was drawn up between the Saline Valley Salt Com-



Map by Norton Allen / *Desert* Magazine, Aug. 1959

pany and the Trenton Iron Company of Trenton, New Jersey, one of the world's leading manufacturers of trams. They were to use the Bleichert System, developed in Germany, to which the Trenton Iron Company had rights in the United States. During the tram project, however, the Trenton Iron Company sold out to U.S. Steel.

It was estimated that the tram would cost between $250,000 and $500,000. Construction began in 1911, with the project to be completed by May 1912. It was to deliver 20 tons of salt per hour, the buckets to move 500 feet per minute, about 5½ MPH. The tram was to go up 7000 feet from Saline Valley to the crest of the Inyo Mountains, and down 5000 feet to Swansea on the west side. There were to be angle changes; the line would not be straight. Plans called for five separate trams joined end to end. A record amount of cable was to be used on the project. The buckets would be carried on 1⅛ inch cable, a little thicker for Daisy Canyon, and that for the return of empty buckets would be ⅞ inch. The total length of cables for the two lines, running over the 13½ mile round-trip course, would be 54 miles. It was a most ambitious undertaking!

DAISY CANYON PRESENTED problems from the beginning. There was great difficulty even in making the survey. In numerous cases several days were consumed in finding a possible route to ascend summits of the cliffs. In spite of overwhelming obstacles throughout the project, it appears that no major crisis occurred. There is no record of any lives being lost, a large plus to their credit in those days before safety requirements. The two men in charge of overseeing construction were C. H. Wickham, chief engineer for the Trenton Iron Company, and W. H. Leffingwell (previously from Bishop), civil engineer for the Saline Valley Salt Company.

Fortunately a railroad was available for shipping. The Southern Pacific R.R. had a narrow-gauge line that skirted the eastern shore of Owens Lake and terminated at Keeler; this line hosted the historically noted "Slim Princess" with its somewhat miniature-

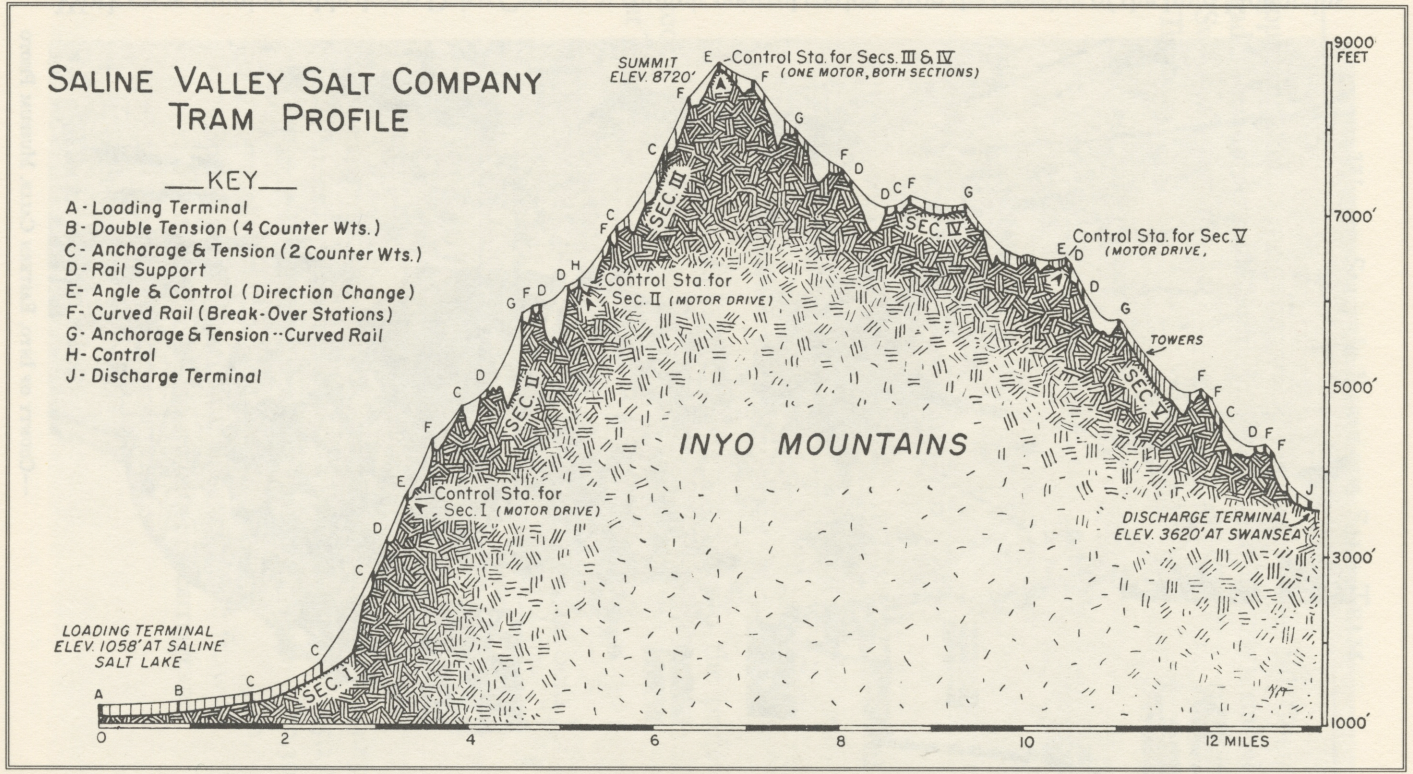


Chart by Norton Allen / *Desert* Magazine, Aug. 1959

—County of Inyo, Eastern Calif. Museum Photo

Work crew running cable down Daisy Canyon at summit control station, atop the crossing of the Inyo Mountains.

appearing engines and rolling stock. The Saline Valley Salt Company had hoped to persuade Southern Pacific to name the terminal site "Swansea", but for reasons of their own the stop was labeled "Tramway".

Specifications for the tramway called for:

1 landing terminal
1 discharge terminal
5 intermediate control stations
21 rail structures
12 anchorage-tension structures
1 double-tension structure
Tools for coupling and splicing track cables and tension caps
Track cable oiling cars, traction rope oiling tanks and water carriers

A tremendous amount of material went into the project. It took 35 to 50 men to unload it from the Southern Pacific railroad at Tramway. They handled:

650 tons of iron in bolts, nuts, braces, etc.
(There were two box cars of nuts and bolts.)
1,300,000 board-feet of Douglas fir lumber
5,000 sacks of cement
265,000 feet of cable

Prominent parts of the specifications were:

Patent locked coil steel track cable, 1¼ inch	13,850 ft.
Patent locked coil steel track cable, 1½ inch	55,250 ft.
Patent locked coil steel track cable, ⅞ inch	69,300 ft.
Special steel traction ropes, ¾ inch	141,000 ft.
Special steel buckets, capacity 12 cubic ft. with protecting covers; and hangers, carriages and patent compression grips	286
Intermediate supports	120
Track cable saddles	240

Steel traction rope rollers with shafts, bearings, bolts, washers, foot castings, etc. 240

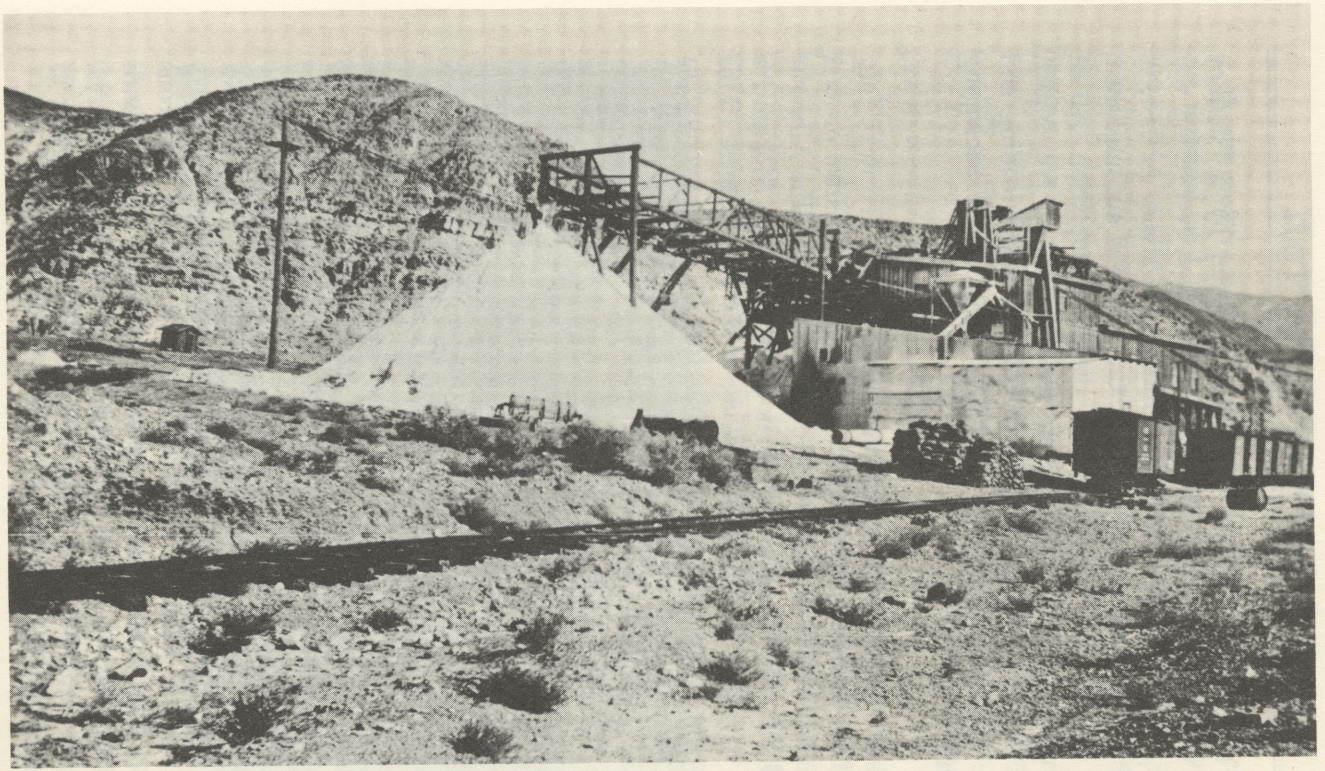
It is mind boggling to think of building 13½ miles of those sturdy towers and stringing miles of cables of different sizes between them. All those two carloads of bolts were put in by hand, the holes drilled and nuts tightened by muscle power. Pneumatics and other time-saving devices of industry had not yet been invented!

The first section to be built was on the west side of the range. No tram construction could be accomplished on the precipitous east side until trails could be built for access up and down Daisy Canyon. That side was so steep that material had to be hauled up by mules or let down by ropes from above. Even after the towers were built it was extremely difficult to string the cables. Blocks of hardwood were used as brakes, the cable clamped between them. The blocks were replaced as they became worn by friction.

Snow was a problem in the winter months—between October and April—especially hindering construction above 6500 feet. Disastrous snow slides occurred at times; drifting snow made it difficult to keep the trails open.

Construction throughout called for patience, endurance and expertise. Each tower was one of a kind due to the changing terrain with legs and supports of varying lengths. Each was built on a concrete foundation, some as deep as three feet. Water for the concrete had to be hauled up by mules. When the winter weather of 1911-1912 stopped work at the higher elevations, it was continued on the lower slopes. Any delay was due to external problems. A major one was caused by confusion as to where the connection to the railhead would be. Plans for the discharge terminal were delayed seven months pending that decision. The parts could not be manufactured until the plans were finalized and the designs completed.

In 1912 the company started hauling construction material from Big Pine by the northern route into Saline Valley. A temporary tram was built in the lower half of Daisy Canyon to haul



—County of Inyo, Eastern Calif. Museum Photo

The Owens Valley terminal of the "Fabulous" Salt Tram, showing tracks and box cars of the narrow-gauge Carson & Colorado R.R. in the foreground. Over 13½ miles of tramway operations extended over the Inyo Range to Saline Valley. This terminus site was officially labeled "Tramway" yet was located immediately adjacent to the community of Swansea, close to Keeler, Calif.

material to the levels above. This was operated by a "donkey engine", which was gasoline-powered. Above that, everything was hauled up by mules on the newly constructed trails. At last, in 1912, the difficult east side up Daisy Canyon was accomplished, some six months after the designated date of completion. All of the towers and control stations were finished by late November. Yet to be done was installation of machinery at the loading and discharge terminals, including classifiers, driers, and packaging equipment.

THE FIRST SALT carried by tram was delivered at Tramway July 2, 1913. That called for a great celebration. Before the final process was in operation, the salt was marked and packaged at the Albright Mill in Bishop. It is interesting to note that Horace Albright, a youth of 22 years, worked at packaging in the early stages. (This was just prior to his leaving for Washington, D. C. to become an attorney for the Department of the Interior. He was later to become Director of the National Park Service, the one who motivated the founding of Death Valley National Monument.) The product was called "Tramway Salt". Upon completion of the terminal facilities, the labeling and packing was all done at Tramway.

The tram was operated by electricity from the Los Angeles Department of Water and Power's Cottonwood power plant. A man who had worked on the Los Angeles aqueduct designed the tram's electrical system. The 75 HP Westinghouse motors required 2200 volts of electricity to operate. The completed tram carried 286 buckets, each one especially coated to prevent corrosion/rusting from salt and water. There were some unforeseen challenges in the operation. For example, on the steepest sections it was necessary to adjust tension to prevent the traction ropes from rising above the track cables. Such an occurrence would cause a disastrous derailment. The summit station, which controlled lines in both directions, had its own special requirements for working both ways. All in all, the challenges of a smooth operation were as great as the design and construction phase.

An impressive settlement grew at Tramway. Besides the unloading terminal and processing structures, the company built five houses for employees. The last of those buildings collapsed from weathering in the late 1980s. The cement foundation for the oil burning drier is still visible. (It was essential that the salt be thoroughly dry before packing.) In addition to the housing at Tramway, a well-built six-room home was furnished for the summit control station. It was still intact in 1960 but soon after that a high wind took off the roof. Then the house gradually disintegrated, due to weathering and vandalism.

Water was hauled to the summit station and stored in a tank under the tram. The operator on that remote summit enjoyed the luxury of running water in his home and even to the nearby corral. For protection from freezing in the winter, the pipe was covered with horse and mule manure. In the current days of smog

—MARY DEDECKER PHOTO

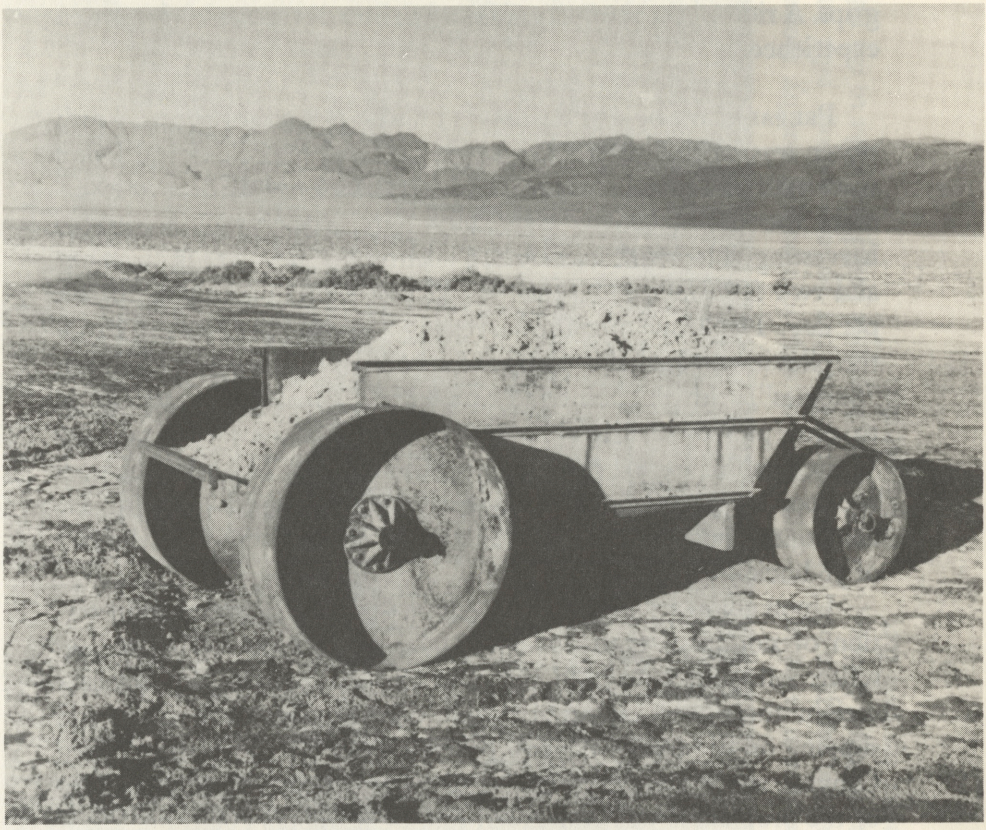
Death Valley '49er Paul DeDecker (at left) and friends rest on the porch at the residence of the summit control station operator. This well-built six-room structure survived into the 1960s when strong winds, weathering and vandalism led to its disintegration.

and congestion many would look upon life at that over mile-high site as an ideal situation. In his home at the top of his world the operator had privacy unlimited, a tremendous view, and transportation right at his door.

Prior to destruction of the house, the author once sat on the porch admiring the expansive view. The foreground was covered with low sagebrush dotted with pinyon trees. Lower slopes which appeared barren had more xeric vegetation dominated by the saltbushes, mostly shadscale. Tram towers marched down the comparatively gentle slopes. Beyond the last low ridge was the white bed of Owens Lake. It would have been a vivid blue when the house was occupied prior to diversion of its source, the waters of the Owens River. Beyond that the view was abruptly cut off by the corrugated wall of the mighty Sierra. The house was just below the crest so there was no view of Saline Valley. One wonders whether the operator had a wife to cook his meals and hang curtains on the windows. If so, did she love the place or hate its isolation?

Down in Saline Valley it was more primitive. No homes were built there. The workers apparently lived in tents or tent houses which did little to alleviate the intense heat. It is said that most workers there were Mexicans or Indians who seemed best able to endure the heat. Then again, perhaps they were the only ones who *would* endure the heat. The temperature commonly reached 120° on the salt fields, and the torrid nights gave little relief—surely they had trouble sleeping. One advantage though was the access to fresh fruit and vegetables grown at the nearby Indian Ranch. The rich soil there, above the alkaline basin, was watered by a ditch cutting across the alluvial fan from Hunter Canyon. Delicious watermelons were a special treat. Someone even came up with a proposal to tunnel through the Inyos to Owens Valley to provide a market for those wonderful watermelons.

Some workers, as well as maintenance people, rode the tram buckets to the job. Others considered it too dangerous. They were afraid of being dumped in Daisy Canyon by failure of the bucket



—Mary DeDecker Photo

One of the specially built steel and galvanized iron "buggies" designed for use in the Saline Valley salt fields. Equipped with 12-inch wide rear wheels, the contrivance—capable of carrying 1000 pounds of payload—was pulled across the salt flats by ½-inch cables from a gasoline-powered winch, then transported by small wooden cars on steel tracks to the loading terminal.

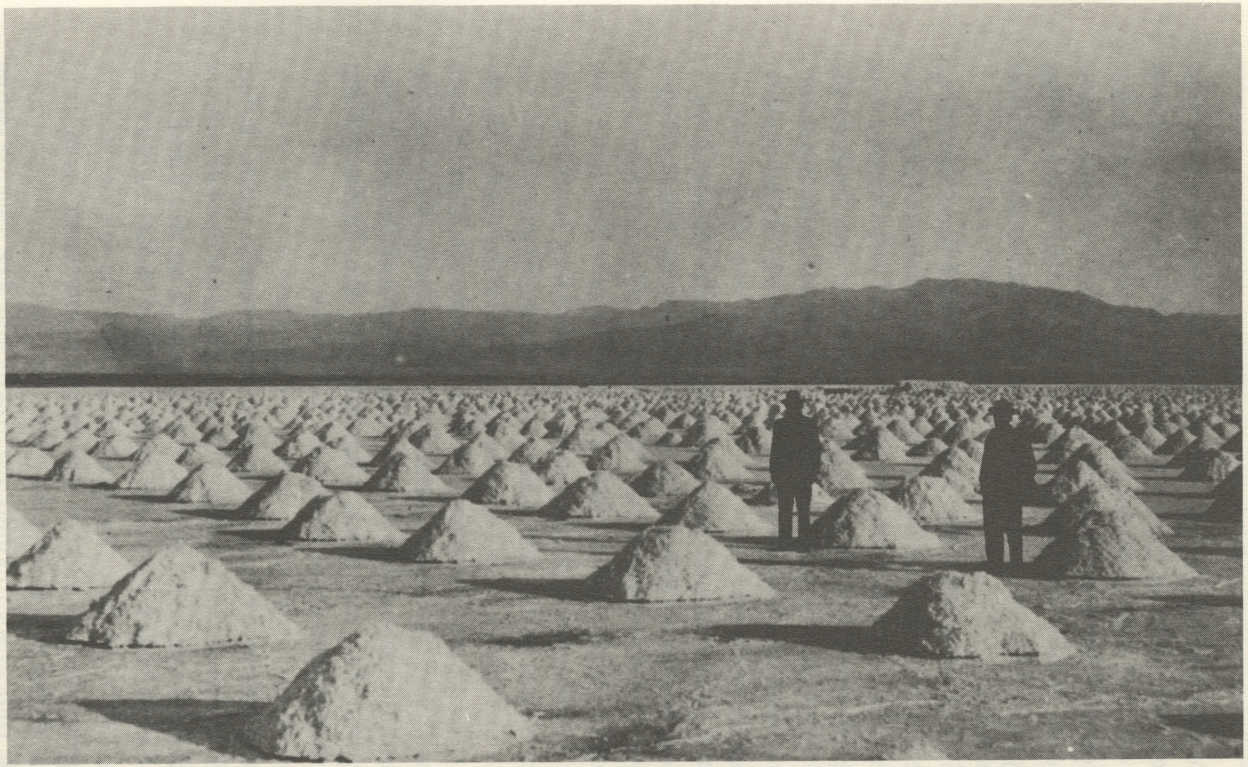
grips. A ride on the tramway was said to be a never-to-be-forgotten experience.

PREPARATION OF THE SALT was mostly a natural process. Fresh water was carried in wooden pipes to flood the salt fields. Dikes were used to control spreading. There was plenty of heat to evaporate the water, leaving essentially pure salt crystals ready for harvesting. The workers shoveled it into piles, 3½ feet in diameter and two feet high. Each man could pile eight to ten tons of salt per day. The prime time for harvesting was May to October. From the piles it was loaded into specially built steel and galvanized iron "buggies", with 12-inch wide rear wheels, capable of carrying up to 1000 pounds of salt. These were pulled across the surface by ½ inch cables from a gasoline-powered winch. The salt was then transported by small wooden cars which ran on a track to the loading terminal, where it was sent out over the tramway at the rate of 56 buckets per hour.

Upon completion of the tram there was to be a trial demonstration of not more than 60 days under supervision of buyer and seller. All went well until the buckets were ⅔ full. Beyond that weight there were many accidents due to runaway carriers and slipping on the traction ropes. Buckets were falling off into Daisy Canyon, and it was very difficult to retrieve them. After due study of the problem it was concluded that the grippers could not adapt to operating conditions on the steep slopes. Different types of grips were tried for two years, but none stood the test. Trenton Iron Company then took over the operation. It designed a new grip capable of holding the heaviest bucket, plus the weight of one man, a line rider. All 286 grips were changed, along with some of the cables in an effort to stabilize the operation.

By the end of 1913 over 5000 tons had been shipped over the tram. In February 1914 the company was sending nine to fifteen narrow gauge railroad cars of processed salt per week. The shipments were very good, considering the problem with the grips.

In the meantime the Saline Valley Salt Company was having



—County of Invo, Eastern Calif. Museum Photo

"Pass the salt, please!" Many sessions of savoring one's meal got its commercial start in vast piles of pure salt crystals such as these in Saline Valley. Seen above are 3½ foot diameter by two feet high piles of salt, accumulated not by motor-driven tractors, but by man-power, rake and shovel. Each worker could pile eight to ten tons of salt per day.

financial difficulties and could not pay its bills. Its choices were bankruptcy, sell-out, or lease. At the end of 1914 its board of directors voted to lease the tram and salt fields to the Owens Valley Salt Company. The new company's goal was to produce 50,000 tons per year. Half of the revenue was to go to the Saline Valley Salt Company. The name of the product was changed to "White Mountain Salt".

By 1916 all was well. The grip problem had been solved, 40 men were employed in the salt fields, the mill was handling 25 to 30 tons per day and working really well, and the demand was exceeding the supply. A narrow gauge spur line was built to the mill. Talk of a standard gauge railroad, to handle increased production, was voiced, but that idea never materialized. Other troubles were to come, however.

Financial problems and internal difficulties developed in 1917. One faction wanted to cancel the contract with the Owens Valley Salt Company and reorganize as "Tramway". The majority wanted to merge with the Owens Valley Salt Company and have new directors. There were legal problems too, including law suits filed against the Saline Valley Salt Company. Mr. Leffingwell sued for back pay. U. S. Steel sued for money owed on the tram. Finally the tram itself ceased operation. The outcome was that in 1920 the salt fields and tram were owned by U. S. Steel. That was the end of both the Saline Valley Salt Company and Owens Valley Salt Company. The salt fields were leased to the Taylor Milling Company but the tram was not used.

NOTHING HAPPENED WITH the tram in the early 1920s. White Smith had not given up, though. He remained in the salt picture and was still looking for backers. In 1924 he proposed building a road into Saline Valley from the south by way of San Lucas Canyon. This was to provide transportation from the salt fields. Inyo County agreed to pay most of the cost, the remainder to be paid by citizens. White Smith won the bid.

It took two years to build the road from Lee Flat to Saline

Valley. An average of 12 men worked at building the road. Flash floods occurred which created serious problems. The county provided $20,000 which did not cover the cost, but the road was completed. In the meantime, George Russell and White Smith had gained control of the salt fields. Russell was in charge, and Smith, an attorney, was an advisor. Salt piled up.

The road was accepted in May 1926 by the Inyo County Supervisors. That same year a new salt enterprise, the "Sierra Salt Company", was formed. This firm gave the sodium chloride business a try, hauling salt out through contract via the newly completed San Lucas Canyon road, utilizing 10-ton trucks in the process. It was a one-day haul to Keeler, Tramway, and the railroad. (From these points it was shipped by train to Los Angeles, except for the portion which was used by various sources in Owens Valley). But a word about the San Lucas Canyon road is in order. Anyone who has seen that route today, as it maneuvers across and around 100-foot dry falls, will marvel that anyone had the courage to drive a truck over it. The site was known locally as "the pearly gates". Small wonder that it was in use for only a brief period.

White Smith was hired by the new company as a technical advisor. Sierra Salt Company, exercising an optimistic view, planned to build a new mill in Los Angeles to process "Sun Brand" salt, but that plant was never erected. Instead, they reconditioned the mill at Tramway, brought in new equipment for the workings there as well as the salt fields. They did not plan to use the tramway. In the meantime Paul Watterson was negotiating with U. S. Steel to acquire the tram for transporting silver ore from the "Big Silver Mine", located just one canyon north of Daisy Canyon in Saline Valley. As it turned out, Watterson did not buy the tram.

The death of White Smith in 1927 marked the end of the major impetus in Saline Valley's salt production, but it did continue for a time.

Early in 1928 the Sierra Salt Company decided to buy the tram from U. S. Steel and put it to use again. After all, it had been proven to be the best way of transporting the product. The remain-

der of the year was spent in overhauling the complexities of the tram's 13½ mile route. By December it was transporting salt once again. The company was employing 40 men in all. From 60 to 100 tons of salt were produced daily.

In spite of this encouraging operation, the Sierra Salt Company was faced—like its predecessors—with financial problems, feeling the pinch especially so in 1931. By 1933 it went into receivership. The sad reality was that the monetary value of salt was not high enough to finance getting it to market; plunging prices brought about by the Depression, then in full force, may well have heralded the decline. White Smith's dream created an exciting chapter in Inyo County's history. In spite of the tons of salt harvested, there are still vast fields of it there for the taking.

As for the tramway, vandalism has taken its toll. Anything removable has disappeared. Few of the sturdy towers are left, except in inaccessible places, such as Daisy Canyon. The entire route is now on Bureau of Land Management (BLM) land. There are heavy penalties for vandalism, but it is too late to save more than mere tokens of that remarkable achievement.

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